

CA2ΦNEP

- 73R36

[G-P]

rivers of power

Government
Publications



3 1761 11893374 6

LIBRARY

JUL - 9 1973

UNIVERSITY OF TORONTO



*Ontario Hydro-Electric Power Commission
[General publications]*

the Ottawa-Madawaska system

rivers of power

The Ottawa and Madawaska rivers, rich in history and in beauty, provide 20 per cent of Ontario's hydro-electric resources.

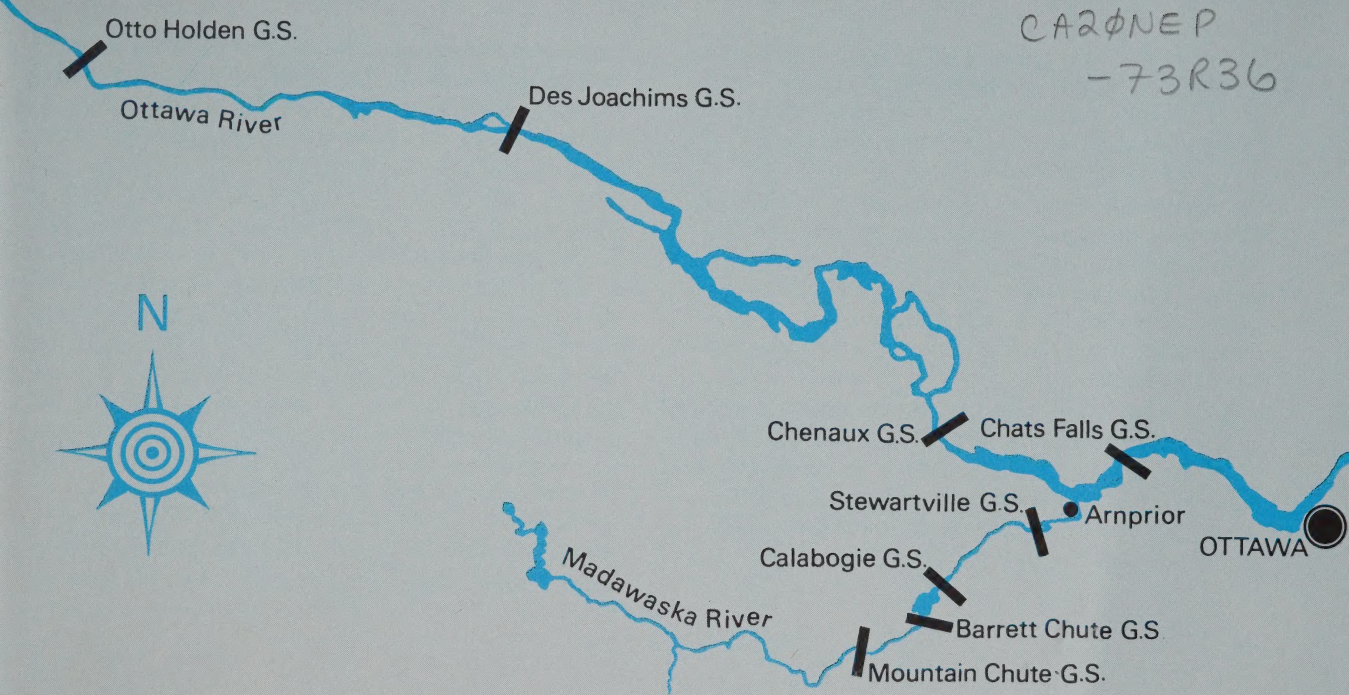
Eight stations situated on the two rivers have a total installed capacity of more than 1.3 million kilowatts. These rivers, together with the Niagara and the St. Lawrence, provide the lion's share of hydro-electric power in the province.

The Ottawa played an important role in the early development of Canada. Indians first used the river as a route to and from the interior – an example followed in turn by explorers, fur traders and lumberjacks.

The Madawaska was the scene of early lumbering drives and mining operations in Ontario.

The Ottawa rises in the Quebec watershed dividing the Hudson Bay and St. Lawrence systems. This vast drainage basin was carved from the Precambrian rocks of the Canadian Shield by the last ice age.

CA20NEP
-73R36



Otto Holden G.S.

Ottawa River

Des Joachims G.S.

Chenaux G.S.

Chats Falls G.S.

Stewartville G.S.

Arnprior

OTTAWA

Calabogie G.S.

Madawaska River

Barrett Chute G.S.

Mountain Chute G.S.

N

Evidence of the retreating glaciers can be seen today in the gorge facings and rock formations. For 400 of its 700 miles, the Ottawa is the boundary between Ontario and Quebec. The river flows into the St. Lawrence near Montreal.

The Madawaska, one of the Ottawa's most important tributaries, flows and tumbles through some of Canada's most picturesque scenery. Originating in the lakes of Algonquin Park, the Madawaska drops more than 1,000 feet during its 140-mile course, and enters the Ottawa River at Arnprior, 35 miles west of the nation's capital.

Ontario Hydro pays close attention to flood control and conservation in relation to the power stations on the two rivers. Power station spillways are designed to cope with 150 per cent of the highest recorded discharge. The man-made lakes behind each power station are ideal for boating and canoeing.

Plant operators are kept up to date on meteorological findings which could affect river flows and levels. This knowledge is of vital importance in averting flooding during the spring run-off and in planning the most efficient use of each power station. When possible, the dams are used to increase downstream flows during low-water periods.

Special equipment is being installed to permit the operation of all stations on the two rivers from a control room at the Chenaux generating station on the Ottawa, 12 miles northwest of Renfrew.

Operators in the Chenaux control room can start or stop the power supply at any of the connected stations by pushing appropriate control buttons. Readings such as line loadings and generator voltages can be taken at any time, while a built-in alarm system warns immediately of malfunctions such as overheated bearings or a cooling failure on a transformer.

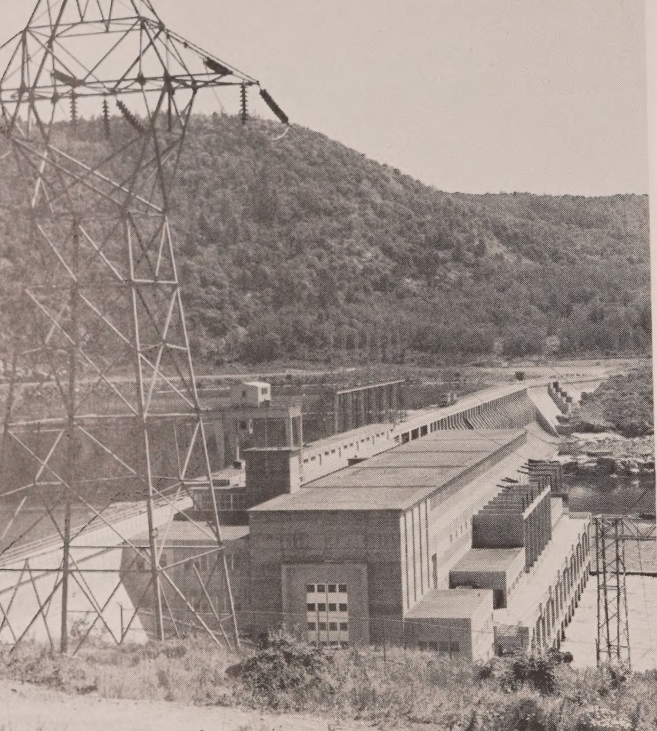
If any problem arises at a remotely controlled station, operators can be dispatched immediately. Maintenance crews visit each plant regularly.

Ottawa River plants

Fluctuations in the Ottawa's flow necessitate flexible methods of operation. Output of the Ottawa plants depends on the amount of water available for power production and system requirements.

Madawaska stations, however, are operated primarily to meet peak demands which occur for a few hours each day. These "peaking stations" provide maximum output at such times to supplement other plants in the provincial system. Water is stored during off-peak hours.

In emergencies such as the loss of a large thermal-electric unit, the Madawaska stations are also available to supply power instantly.



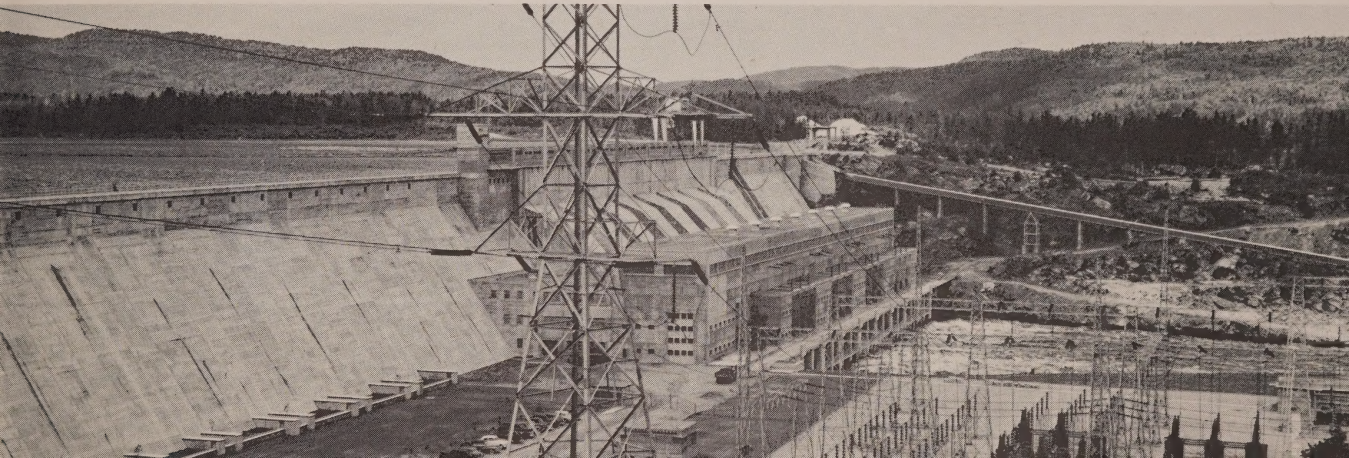
Otto Holden

The farthest upstream of the river's four hydro-electric stations, Otto Holden is 36 miles east of North Bay, near Mattawa, and was named in honor of a former chief engineer of Ontario Hydro. The plant opened in 1952 and is capable of producing 205,200 kilowatts from eight generating units. Its main dam is 2,500 feet long and has a maximum height of 130 feet. Creating the 30-mile lake behind the powerhouse called for the relocation of 37 miles of railway line and three miles of highway. The lake is half-a-mile wide.

Des Joachims

The largest generating station on the Ottawa, Des Joachims is about 52 miles downstream from Otto Holden near Deep River. It has eight units with a total capacity of 360,000 kilowatts. Pronounced "Dah Swisha", the local name comes from two Indian boys

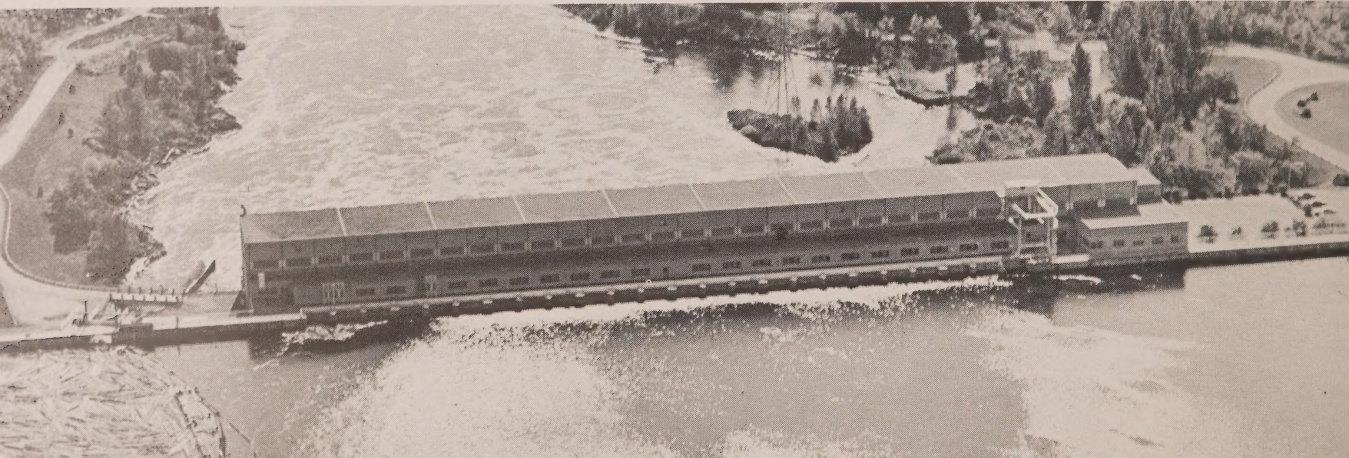
(family name Joachims) who drowned in the rapids in the early 1800's. Des Joachims produced first power in 1950. Three dams were built as part of the project, which cost a total of \$76 million. The powerhouse is at the base of the main dam. The station's tailrace channel is 7,000 feet long and was excavated through solid rock.



Chenaux

Chenaux generating station, 12 miles northwest of Renfrew, has 122,400 kilowatts of capacity from eight units. Sixty miles downstream from Des Joachims, it was named after the rapids on which it was built. The headpond at Chenaux forms a lake seven miles

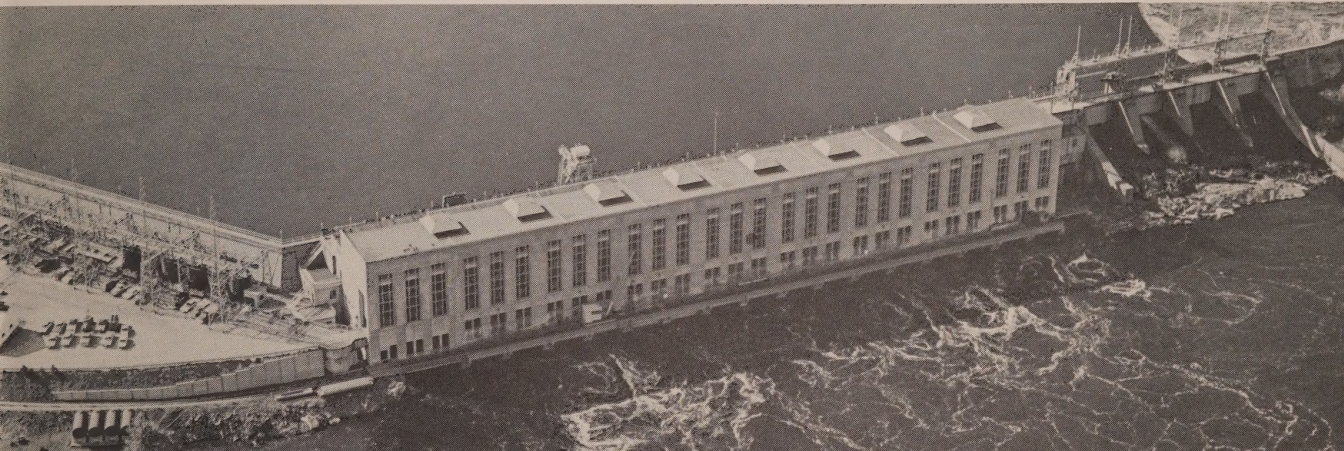
long, with an average width of one mile. Four dams with a total length of 4,000 feet were required to close off the river at the site. The remote control centre for operating other power plants on the Ottawa and Madawaska is located in the powerhouse at Chenaux.



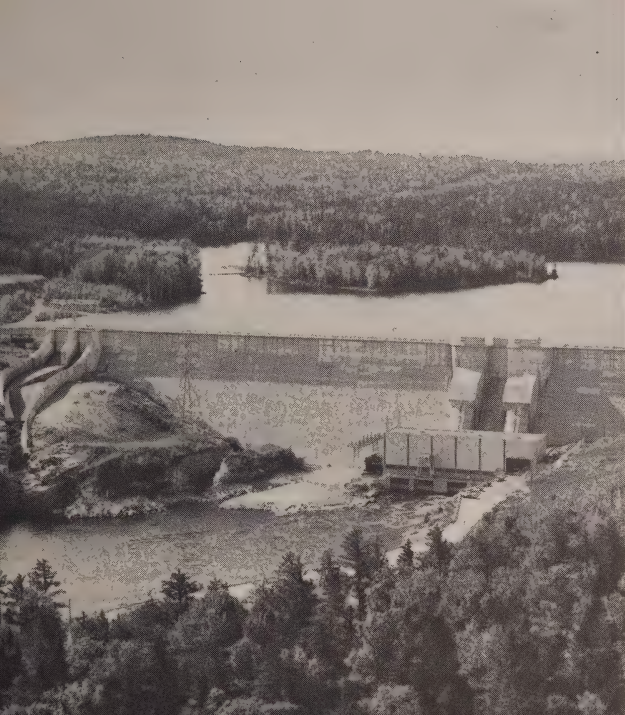
Chats Falls

The first of the major power projects built on the Ottawa, Chats Falls started up in 1931. Jointly built and owned by Hydro and the Ottawa Valley Power Co., of Quebec, Chats Falls is about 35 miles northwest of the city of Ottawa. Its eight units provide 178,600

kilowatts. At this site, the river narrows between two big lakes. The Chats Falls dam is a low, U-shaped structure more than three miles long. The powerhouse itself straddles the interprovincial boundary.



Madawaska River plants



Mountain Chute

Mountain Chute, 22 miles southwest of Renfrew, first produced power in 1967, the year of Canada's 100th birthday. Appropriately, the new expanse of water created upstream from its dam is named Centennial Lake. Beneath its waters are the remains of the Black Donald mining settlement and graphite mine, abandoned in 1947 after being worked out. Mountain Chute, the most upstream of the Madawaska series of power stations, has two generators with a combined capacity of 139,500 kilowatts.

Barrett Chute

Barrett Chute generating station, eight miles downstream from Mountain Chute, was the first built by Hydro on the Madawaska. Initially, the station went into service with two generators in 1942. Two more units were added in 1968 to give the station its present capacity of 152,400 kilowatts. The expansion project called for deepening of the canal and creating a headpond covering 3,500 acres.

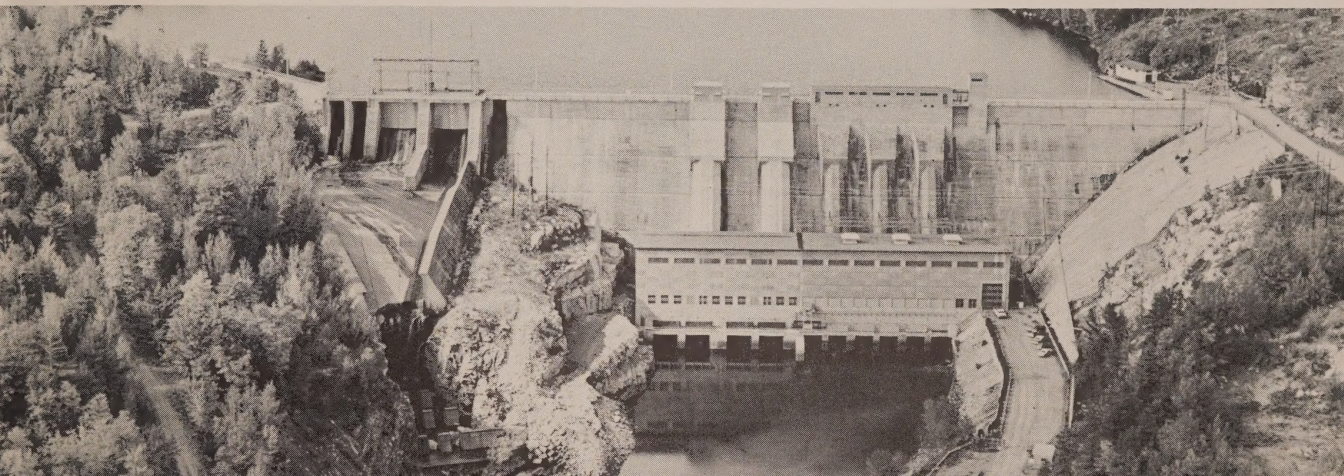
Calabogie

The oldest power plant on the Madawaska, Calabogie first produced power in 1917 and was bought by Ontario Hydro in 1929. Named after the village in which it is located, five miles downriver from Barrett Chute, Calabogie has a 4,000-kilowatt capacity from two generators. The powerhouse is located on the south channel of the river, which was enlarged considerably in 1968 to cope with increased peak flow from the two stations upstream. Another dam spans the north channel.

Stewartville

Situated between Calabogie and Arnprior, Stewartville has 153,000 kilowatts capacity – more than double the output of its first three units, placed in service in 1948. Two more were added in 1969. The main dam is 206 feet high and 830 feet long. A 500-foot

wing dam helps contain the headpond, which is 150 feet deep at the dam. The powerhouse is equipped with a 120-ton travelling crane.



Arnprior

Construction of the newest power plant on the Madawaska – in the town of Arnprior – started in 1973. The plant will have a two-unit capacity of 87,000 kilowatts and is designed to correct erosion problems which have threatened to limit the peaking operations of upstream plants. The artificial lake created by the new dam will provide a valuable recreational facility.

